CLAIMS

1. A method of forming an opening through a substrate having a first side and a second side opposite the first side, the method comprising:

forming spaced stops in the first side of the substrate;

partially forming a first portion of the opening in the substrate from the second side by a first process;

further forming the first portion of the opening in the substrate from the second side by a second process, including forming the first portion of the opening to the spaced stops; and

forming a second portion of the opening in the substrate from the first side, including forming the second portion of the opening between the spaced stops.

2. The method of claim 1, wherein partially forming the first portion of the opening includes dry etching into the substrate from the second side.

3. The method of claim 2, wherein dry etching into the substrate includes deep reactive ion etching into the substrate.

4. The method of claim 1, wherein partially forming the first portion of the opening includes laser machining into the substrate from the second side.

5. The method of claim 1, wherein further forming the first portion of the opening includes wet etching into the substrate from the second side and terminating the wet etching with the spaced stops.

6. The method of claim 1, wherein forming the second portion of the opening includes wet etching into the substrate from the first side between the spaced stops.

7. The method of claim 1, wherein further forming the first portion of the opening and forming the second portion of the opening includes simultaneously etching into the substrate from the second side toward the first side and from the first side toward the second side.

8. The method of claim 1, wherein forming the spaced stops includes spacing the spaced stops at a first dimension in a first direction, and wherein partially forming the first portion of the opening includes partially forming the first portion of the opening with a second dimension one of equal to and less than the first dimension in the first direction.

9. The method of claim 8, wherein the second dimension is positioned within the first dimension.

10. The method of claim 1, wherein forming the spaced stops includes defining a maximum dimension of the second portion of the opening.

11. The method of claim 10, wherein forming the spaced stops further includes defining a minimum dimension of the first portion of the opening.

12. The method of claim 1, wherein forming the spaced stops includes extending the spaced stops into the substrate substantially perpendicular to the first side of the substrate.

13. The method of claim 1, wherein forming the spaced stops includes forming spaced slots in the first side of the substrate and disposing an etch resistant material in the spaced slots.

14. The method of claim 13, wherein forming the spaced slots includes etching into the substrate from the first side.

15. The method of claim 14, wherein etching into the substrate includes dry etching into the substrate.

16. The method of claim 15, wherein dry etching into the substrate includes deep reactive ion etching into the substrate.

17. The method of claim 13, wherein the substrate is formed of silicon and the etch resistant material includes an epoxy.

18. A method of forming a substrate for a fluid ejection device, the method comprising:

forming spaced stops in a first side of the substrate;

partially forming a first portion of a fluidic channel in the substrate from a second side opposite the first side by a first process;

further forming the first portion of the fluidic channel in the substrate from the second side by a second process, including forming the first portion of the fluidic channel to the spaced stops; and

forming a second portion of the fluidic channel in the substrate from the first side, including forming the second portion of the fluidic channel between the spaced stops.

19. The method of claim 18, wherein partially forming the first portion of the fluidic channel includes dry etching into the substrate from the second side.

20. The method of claim 19, wherein dry etching into the substrate includes deep reactive ion etching into the substrate.

21. The method of claim 18, wherein partially forming the first portion of the fluidic channel includes laser machining into the substrate from the second side.

22. The method of claim 18, wherein further forming the first portion of the fluidic channel includes wet etching into the substrate from the second side and terminating the wet etching with the spaced stops.

23. The method of claim 18, wherein forming the second portion of the fluidic channel includes wet etching into the substrate from the first side between the spaced stops.

24. The method of claim 18, wherein further forming the first portion of the fluidic channel and forming the second portion of the fluidic channel includes simultaneously etching into the substrate from the second side toward the first side and from the first side toward the second side.

25. The method of claim 18, wherein forming the spaced stops includes spacing the spaced stops at a first dimension in a first direction, and wherein partially forming the first portion of the fluidic channel includes partially forming the first portion of the fluidic channel with a second dimension one of equal to and less than the first dimension in the first direction.

26. The method of claim 25, wherein the second dimension is positioned within the first dimension.

27. The method of claim 18, wherein forming the spaced stops includes defining a maximum dimension of the second portion of the fluidic channel.

28. The method of claim 27, wherein forming the spaced stops further includes defining a minimum dimension of the first portion of the fluidic channel.

29. The method of claim 18, wherein forming the spaced stops includes extending the spaced stops into the substrate substantially perpendicular to the first side of the substrate.

30. The method of claim 18, wherein forming the spaced stops includes forming spaced slots in the first side of the substrate and disposing an etch resistant material in the spaced slots.

31. The method of claim 30, wherein forming the spaced slots includes etching into the substrate from the first side.

32. The method of claim 31, wherein etching into the substrate includes dry etching into the substrate.

33. The method of claim 32, wherein dry etching into the substrate includes deep reactive ion etching into the substrate.

34. The method of claim 30, wherein the substrate is formed of silicon and the etch resistant material includes an epoxy.

35. The method of claim 30, wherein disposing the etch resistant material in the spaced slots further includes forming a layer of the etch resistant material on the first side of the substrate.

36. The method of claim 35, further comprising:

forming a firing resistor on the first side of the substrate, and

wherein forming the layer of the etch resistant material includes forming the layer over the firing resistor.

37. A substrate for a fluid ejection device, the substrate comprising:

a first side;

a second side opposite the first side;

spaced stops formed in the first side of the substrate; and

a fluidic channel communicating with the first side and the second side,

wherein a first portion of the fluidic channel is partially formed in the substrate by a first process from the second side and further formed in the substrate by a second process from the second side to the spaced stops, and

wherein a second portion of the fluidic channel is formed in the substrate from the first side between the spaced stops.

38. The substrate of claim 37, wherein the first process includes a dry etch process.

39. The substrate of claim 38, wherein the dry etch process includes a deep reactive ion etch process.

40. The substrate of claim 37, wherein the first process includes a laser machining process.

41. The substrate of claim 37, wherein the second process includes a wet etch process.

42. The substrate of claim 41, wherein the spaced stops terminate the wet etch process.

43. The substrate of claim 37, wherein the second portion of the fluidic channel is wet etched into the substrate.

44. The substrate of claim 37, wherein the spaced stops are spaced a first dimension in a first direction, and wherein the first process partially forms the first portion of the fluidic channel with a second dimension one of equal to and less than the first dimension in the first direction.

45. The substrate of claim 44, wherein the second dimension is positioned within the first dimension.

46. The substrate of claim 37, wherein the spaced stops define a maximum dimension of the second portion of the fluidic channel.

47. The substrate of claim 46, wherein the spaced stops further define a minimum dimension of the first portion of the fluidic channel.

48. The substrate of claim 37, wherein the spaced stops are oriented substantially perpendicular to the first side of the substrate.

49. The substrate of claim 37, wherein the spaced stops are formed in spaced slots of the substrate.

50. The substrate of claim 49, wherein the spaced slots are dry etched into the first side of the substrate.

51. The substrate of claim 50, wherein the spaced slots are deep reactive ion etched into the first side of the substrate.

52. The substrate of claim 37, wherein the substrate is formed of silicon, and wherein the spaced stops include an etch resistant material.

53. The substrate of claim 52, wherein the etch resistant material includes an epoxy.

54. The substrate of claim 53, wherein the epoxy includes a photoimageable material.

55. The substrate of claim 52, further comprising:

a layer of the etch resistant material formed on the first side of the substrate.

56. The substrate of claim 55, further comprising:

a firing resistor formed on the first side of the substrate, and

wherein the layer of the etch resistant material is formed over the firing resistor.